(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11) 1 (11)

(43) International Publication Date 30 October 2003 (30.10.2003)

PCT

(10) International Publication Number **WO 03/089145 A2**

(51) International Patent Classification7:

B04B

- (21) International Application Number: PCT/US03/12423
- 18 April 2003 (18.04.2003) (22) International Filing Date:

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/374,308

US 19 April 2002 (19.04.2002)

- (71) Applicant (for all designated States except US): BELL HELICOPTER TEXTRON INC. [US/US]; P.O. Box 482, Fort Worth, TX 76101 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): LIN, Sherman, S. [US/US]; 8109 Shady Oaks Drive, North Richland Hills, TX 76180 (US). POSTER, Scott, D. [US/US]; 3801 Bright Meadow Court, Arlington, TX 76016 (US).
- (74) Agents: WALTON, James, E. et al.; Hill & Hunn, LLP, Suite 1440, 201 Main Street, Fort Worth, TX 76102 (US).

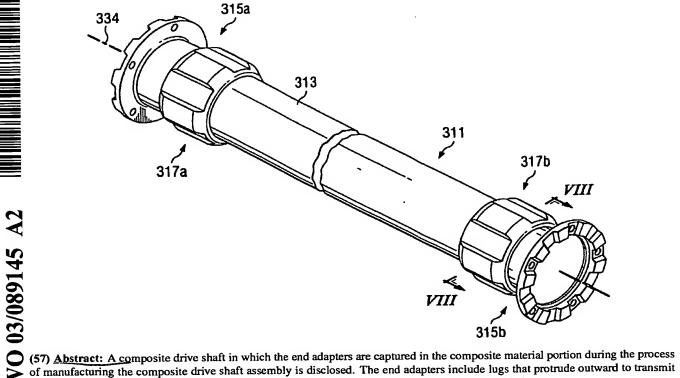
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COMPOSITE DRIVE SHAFT WITH CAPTURED END ADAPTERS



of manufacturing the composite drive shaft assembly is disclosed. The end adapters include lugs that protrude outward to transmit torque, tensile and compressive force, and bending moment to the composite material portion and vice versa.